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L 43123-65
ACCESSION NR: AR5008431

rare earth elements and $K_4P_2O_7$ at pH 6.5 - 13.25. Sodium pyrophosphate compounds of the rare earth elements precipitate immediately when NaCl is added to solutions of rare earth element pyrophosphates in the presence of an excess of $Na_4P_2O_7$ or $K_4P_2O_7$. Associated elements, except for Pb, Ca, Mg, Ba and Sr, do not precipitate under these conditions. Precipitates of orthophosphates, arsenates and vanadates of the rare earth elements dissolve in concentrated solutions of $K_4P_2O_7$. Hot $H_2C_2O_4$ precipitates oxalates with $P_2O_7^{4-}$ impurities from solutions of pyrophosphate compounds of rare earth elements. Th and Sc do not precipitate under such conditions. Oxalates of the alkali metals and F^- do not precipitate rare earth elements. Yu. Kharitonov.

SUB CODE: IC

ENCL: 00

me
Card 2/2

SOV/117-59-7-20/28

25(1)

AUTHOR: Yakovenko, S.M., Engineer

TITLE: Making Babbit Bearings by the Method of Plastic Deformation

PERIODICAL: Mashinostroitel', 1959, Nr 7, pp 36-37 (USSR)

ABSTRACT: The proposed method of coating the inside surface of a bearing with babbit is as follows: a babbit ring is inserted into the orifice of the bearing, and then two flanges are clamped to both ends of the bearing. One of these flanges has an aperture equal in size to the aperture of the bearing in its finished stage. After that, on the press, with the aid of a stepped punch, pressure is applied to the butt end of the ring. Under a pressure of 50 kg/mm^2 the babbit fills in the space between the punch and the bearing wall, firmly covering the latter with a coating of the needed thickness. Detailed information is given on the design of the new device and on the technology of the new method. There are 2 diagrams.

Card 1/1

YAKOVENKO, S.M., inzh.

Extrusion as a method for applying an antifriction layer on the working surface of sliding bearings. Vest.mashinostr. 42 no.7:65-70 Jl '62. (MIRA 15:8)

(Bearings (Machinery))

YAKOVENKO, S.M., inzh.

Using the method of plastic deformation for manufacturing thin-walled bearings. Mashinostroenie no.4:29-32 Jl-Ag '62. (MIRA 15:9)

(Bearing industry)

Z/056/63/020/002/004/007
E073/E135

AUTHOR: Yakovenko, S.M.

TITLE: Manufacture of thin-walled bearings by forming

PERIODICAL: Hutnictví a strojírenství. Přehled technické a hospodářské literatury, v.20, no.2, 1963, 92, abstract HS 63-1123. (Mashinostroyeniye, Kiev, no.4, 1962, 29-32)

TEXT: Equipment for depositing bearing metal on to the component surface by forming is described, and also equipment for depositing bearing metal on to bushes.
24 figures.
[Abstracter's note: Complete translation.]

Card 1/1

YAKOVENKO, T. I.

"An Investigation in the Field of Derivatives of Benzalazine." Cand Tech Sci, Moscow Textile Inst, Moscow, 1953. Dissertation (Referativnyy Zhurnal--Khimiya Moscow, No 2, Jan 54)

SO: Sum: 186, 19 Aug 1954

YAKOVENKO, T. I.

USSR/Chemistry

Card : 1/1

Authors : Bogoslovskiy, B. M., and Yakovenko, T. I.

Title : Derivation of benzaldehyde bromine substitutes

Periodical : Zhur. Ob. Khim., 24, Ed. 6, 1043 - 1044, June 1954

Abstract : The possibility of obtaining certain bromine derivatives of benzaldehyde through the oxidation of homologous toluene bromine substitutes, with the aid of chromic and selenious anhydrides, was investigated. Results showed, that there is a possibility for the preparatory synthesis of 3-bromobenzaldehyde and 3, 5-dibromobenzaldehyde. The presence of steric hindrances is the cause for the difficult oxidizability of 4-bromotoluene and the complete non-oxidizability of 2, 4, 6-tribromotoluene.

Institution : The Moscow Textile Institute

Submitted : December 14, 1953

SMIRNOV, Ye.A.; YAKOVENKO, T.I.

Compounds with electron-donor systems. Part 7: Chromaticity of the derivatives of N-(phenylglycyl)-O-(4''-nitrobenzoyl)-4,4'-aminohydroxydiphenyl. Zhur. org. khim. 1 no.6:1082-1087 Je '65. (MIRA 18:7)

1. Moskovskiy tekstil'nyy institut.

YAKOVENKO, T.I.

469

AUTHORS: Bogoslovskiy, B. M., and Yakovenko, T. I.

TITLE: Investigation of Benzalazine and its Derivatives. Part 1. Reaction of Hydrogen Chloride with Benzalazine and its Derivatives (Issledovaniye v oblasti benzal'azina i yego proizvodnykh I. Deystviye khloristogo vodoroda na benzal'azin i yego proizvodnyye)

PERIODICAL: Zhurnal Obshchey Khimii, 1957, Vol. 27, No. 1, pp. 159-168 (U.S.S.R.)

ABSTRACT: The authors investigated benzalazine and a number of its symmetrically formed derivatives having electro-donor and electro-acceptor substitutes in various arrangements relative to the central atom grouping of benzalazine. The color of the benzalazine derivatives was found to be identical or nearly identical. A considerable change in the color was observed in hydrochlorides obtained during the reaction of dry hydrogen chloride with solutions of benzalazine derivatives in organic solvents (with exception of the benzalazines which do not attract hydrogen chloride). The authors obtained mono- or dihydrochlorides which differed in color from the basic product and were unstable

Card 1/2

Textile Inst. Moscow

Investigation of Benzalazine and its Derivatives

to the effect of moisture. As is evident from the data given in tables the color of the benzalazine hydrochlorides and their derivatives is in direct dependence upon the chemical structure and especially upon the nature of the substitutes in the benzene rings of benzalazine and their arrangement with respect to the central atom grouping of benzalazine and with respect to each other. Using modern electron devices, efforts were made to explain the color changes in benzalazine derivatives observed during their reaction with dry hydrogen chloride. The effect of hydrogen chloride apparently causes the formation of ammonium salts due to the arrangement of one of the nitrogen atoms in the central benzalzine atom grouping.
One table, 5 graphs. There are 15 references, of which 9 are Slavic.

ASSOCIATION: The Moscow Textile Institute (Moskovskiy Tekstil'nyy Institut)

PRESENTED BY:

SUBMITTED: June 3, 1955

AVAILABLE:

Card 2/2

YAKOVENKO, V., inzh.

Control of the feeder systems for aneroid-membrane devices. Grazhd. av. 14 no.8:35 Ag '47. (MLRA 10:9)
(Aeronautical instruments)

YAKOVENKO, V

4 1

Upravlenie Sistemami Pitaniia Ane-

1-4E1b

as altimeters, variometers, and speed in-

YAKOVENKO, V., komandir zvena samoletov spetsial'nogo primeneniya
(Dnepropetrovsk)

Collective farmers' gratitude. Grazhd.av. 13 no.2:8 F '56.
(MLRA 9:5)

(Aeronautics in agriculture)

YAKOVENKO, V., inzh.

Construction of reinforced concrete searchlight poles in harbors.
Mor. flot 20 no.11:37 N '60. (MIRA 13:11)
(Searchlights) (Reinforced concrete construction)

YAKOVENKO, V.A., prof.

On the one-hundredth anniversary of the birth of Grigorii Vital'evich Khlopin. Gig. sanit. 28 no.2:49-53 '63 (MIRA 17:2)

YAKOVENKO, V.A.

Using induction transducers. Stan. i instr. 35 no. 4: 9-21
Ap '64. (MIRA 17:5)

YAKOVENKO, V.A., kand.tekhn.nauk; DONCHEV, D.S., inzh.

Switching parameters of one-way loop and frog leg windings.
Elektrotekhnika 36 no.12:50-52 D '65.
(MIRA 19:1)

YAKOVENKO, V.A.

110-4-2/25

AUTHOR: Yakovenko, V.A., Candidate of Technical Sciences

TITLE: The Influence of Eddycurrents on the Commutation of a d.c. Machine with Shock Loading (vliyaniye vikhrevykh tokov na kommutatsiyu mashin postoyannogo toka pri tolchkoobraznykh nagruzkakh)

PERIODICAL: Vestnik Elektropromyshlennosti, 1958, No. 4, pp. 5 - 9 (USSR)

ABSTRACT: Previous works have shown that one of the factors that influences commutation on d.c. machines during shock loading is disparity between reactive and commutating e.m.f. caused by eddy-currents in the frame and commutating poles. This effect is particularly marked in modern drives, where severe transient processes occur. Attempts have been made to overcome this influence of eddy-currents by using inductive shunts, also by making the magnetic circuit of high-resistance steel and by laminating the commutating pole.

Investigations of different constructions of frame and commutating poles were conducted to form a numerical estimate of the influence of eddy currents on commutation. Direct-current machines, types ПН-68, 6 kW, 1 500 r.p.m. and ПН-550, 69 kW, 1 000 r.p.m. were made with various constructions of frame and commutating poles. Tests were also run on some machines manu-

Card1/4

factured by the Khar'kov Electrical Mechanical Works (XEMZ) including generator type ПБК 215/40, 4 000 kW, 500 r.p.m. with laminated frame and commutating pole.

The investigations consisted in determining the lag of the commutating flux behind the load current; the nature of current distribution in the brush contact; and the zone of sparkless commutation. The techniques are described. Tests were made on six variations of machine, type ПН-68 with various combinations ranging from solid frame and commutating poles to laminated frame and commutating poles. Curves of the load-current increase and the commutating flux of the commutating pole are given in Fig.1. Curves of diminution of load-current and commutating flux of commutating poles are given in Fig.2. The data obtained from these characteristics were used to draw up Tables 1 and 2, which show the changes in the uncompensated reactive and excess commutating e.m.f.

Sparking was observed in machines with solid frames or solid commutating poles. There was no sparking when both frame and commutating poles were laminated. To investigate current distribution in the brushes, those of one polarity were subdivided radially into three equal parts, insulated from one

110-4-2/25

The Influence of Eddy-currents on the Commutation of a d.c. Machine with Shock Loading

another and from the brush holders. Oscillograms showing the current distribution in the brush face with different variants of magnetic path are given in Figs. 3 and 4. As will be seen from Fig.3, when both frame and commutating poles are solid, the distribution is not uniform. Laminated poles and commutating poles improve the current distribution, particularly when both are used together.

Curves were plotted to determine the enlargement of the zone of sparkless commutation during transient processes. Comparative characteristics for machine, type ПН-68, are given in Fig.5, and show how extension of the sparkless zone during shock loading is achievedby the use of laminations in all or part of the magnetic circuit.

The investigations demonstrated that commutation during shock-loading is much improved in machines with laminated commutating poles and frames, which are therefore recommended for all large- and medium-sized machines subjected to shock loadings and for traction motors. Laminated commutating poles should be used on all except the smallest machines. There are 6 figures, 2 tables and 4 Russian references.

Card3/4

110-4-2/25

The Influence of Eddy-current on the Commutation of a d.c. Machine with Shock Loading

ASSOCIATION: Khar'kov Polytechnical Institute (Khar'kovskiy politekhnicheskiy institut)

SUBMITTED: May 29, 1957

AVAILABLE: Library of Congress

Card 4/4

Vasiliy Aleksandrovich

SOV/144-59-6-7/15

AUTHORS: ~~Yakovenko, V.A.~~ and Tolkunov, V.P. Candidates of Technical Sciences, Docents

TITLE: The Commutation of DC Machines with Frog-leg (Composite Lap and Wave) Windings

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1959, 2 Nr 6, pp 55 - 65 (USSR)

ABSTRACT: Frog-leg armature windings for DC machines were introduced at the Khar'kovskiy elektromekhanicheskiy zavod (Khar'kov Electro-mechanical Works) in 1933, at the initiative of Engineer A.I. Levitus and are now very widely used. This article attempts a close examination and analysis of commutation in such machines. A frog-leg winding is a composite winding consisting of a lap winding and a wave winding placed in the same slots and connected to the same commutator. Thus, four ends are connected to each commutator segment and the presence of the lap and wave components does not double the number of parallel paths. The conditions that a frog-leg winding must fulfil in order to operate satisfactorily are then briefly stated. The most widely used type of frog-leg winding is that shown in Figure 1, which also indicates the usual arrangement

Card1/5

SOV/144-59-6-7/15

The Commutation of DC Machines with Frog-leg (Composite Lap and Wave) Windings

of conductors in slots. Determinations are then made of the displacement of commutation time for individual layers of the slot. The process of commutation in a slot is considered with reference to the case illustrated in Figure 2. As the winding rotates, the lap component is shorted at the instant when the brush commences to cover the commutator bar connected to the right-hand side of the coil; whilst the wave component commences to commutate when the brush approaches the bar connected to the left-hand end of the coil. It is then shown that the layers of each armature slot commence to commutate in a definite time sequence, as indicated in the lower part of Figure 2. Formulae are then derived for the specific self-induction susceptance of each layer of the slot and also the specific mutual inductance permeance between individual layers. Formulae (6), (5), (8), (9), (10) and (4) show that the reactive fields constructed separately for the wave and lap components of the winding differ somewhat in size and shape.

Card 2/5

SOV/144-59-6-7/15

The Commutation of DC Machines with Frog-leg (Composite Lap and Wave) Windings

This makes for difficulty in compensating the reactive field by auxiliary poles. However, the differences between the fields are quite small and do not much affect the process of commutation.
So far, the frog-leg windings considered have been those of the type illustrated in Figure 4a, but use is often made of the so-called 'cut' frog-leg winding arranged as shown in Figure 4b. The advantages and disadvantages of this kind of construction are briefly described. Susceptance equations are given for the lap and wave components of the winding.
A further construction of frog-leg winding illustrated in Figure 5 is then considered and the differences in commutation time of individual layers are determined. Susceptances are determined for this winding in much the same way as before: Formulae (19), (20), (21) and (22) show that the susceptances for the cut frog-leg winding are somewhat less than for that of Figure 5. However, in the cut frog-leg windings there is practically no potential

Card3/5

The Commutation of DC Machines with Frog-leg (Composite Lap and Wave) Windings

difference between the first and second or the third and fourth layers. Hence, the slot height may be less with this than with the other types of frog-leg winding. Moreover, for all practical purposes, the value of the specific susceptance of the slot part of any of the frog-leg windings is about the same as in a lap winding. This contradicts a commonly held view that the winding of the type shown in Figure 5 has considerable advantages and it is shown that this idea rises from a misconception. Indeed, to a first approximation the values of the mean reactive e.m.f. of a frog-leg winding is equal to that of a simple lap winding.

The commutating properties of the different windings are compared. The mean value of the reactive e.m.f. for all the types of armature winding is found to be approximately the same and none has any special advantages in this respect. The use of frog-leg windings is recommended where commutation is difficult because they have a whole number of equalising connections, provide better equalisation of

SOV/144-59-6-7/15

The Commutation of DC Machines with Frog-leg (Composite Lap and Wave) Windings

magnetic asymmetry and have lower end-winding reactance. The lap and wave components of frog-leg windings are not uniformly heated. The lap component is located inside the wave component and so has much higher local heating, particularly in the end winding of the uncut frog-leg winding. The temperature difference between the two parts of the end winding may be 50 °C, so that the armature loading must be reduced as compared with that of a lap winding.

There are 8 figures and 5 Soviet references.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut (Khar'kov Polytechnical Institute)

SUBMITTED: May 9, 1959

Card 5/5

SOV/144-59-11-4/21

AUTHOR: Yakovenko, V. A., Candidate of Technical Sciences, Docent

TITLE: Methods of Improving the Commutation of d.c. Machines Subjected to Shock-Loading

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1959, Nr 11, pp 20-31 (USSR)

ABSTRACT: Shock-loading of d.c. machines is experienced in rolling-mill drives and other applications and has a bad effect on commutation. In most such cases the commutation problem limits the output of the machinery. Previous work on commutation under conditions of shock-loading is briefly reviewed. Special features of such commutation are: the appearance of a transformer e.m.f. in the short-circuited section of the armature winding; non-linear relationship between armature current and commutating flux of the interpoles, and change in the magnitude and shape of the reactive e.m.f. of the short-circuited section. Eddy-currents in solid parts of the magnetic circuit impair commutation during shock-loading conditions. Commutation can, therefore, be improved by laminating the magnetic circuit of the interpole or

Card 1/4

SOV/144-59-11-4/21

Methods of Improving the Commutation of d.c. Machines Subjected to Shock-Loading

by using magnetic shunts. The benefit gained by the former measure may be seen from the curves plotted in Fig.1 for zones of sparkless operation of various types of machine under steady state and transient conditions. The improvement associated with the laminated core results from the reduced influence of eddy-currents on the rate of increase of the commutating flux; its rate of increase becomes approximately that of the armature current, as may be seen from the curves plotted in Fig.2. Curves of the relative uncompensated reactive e.m.f. on changing the load on a d.c. generator type PN-68 with various types of magnetic system are plotted in Fig.3. The highest curve corresponds to the solid magnetic circuit and the lowest to the fully-laminated magnetic circuit. A method of calculating the rate of increase of commutating flux is then described for the three cases of instantaneous, exponential or linearised-exponential rates of load-current increase. Formulae are derived for the rate of flux increase in each of

Card 2/4

SOV/144-59-11-4/21

Methods of Improving the Commutation of d.c. Machines Subjected to Shock-Loading

these cases, namely, expressions (5), (14), (19) and (23). Flux/time curves calculated in this way are plotted in Figs. 6 and 7, and they agree with experimental results to within 15%, which is sufficient for practical purposes. An inductive shunt or diverter connected in parallel with the interpole winding may be used to reduce the influence of eddy-currents on the rate of increase of commutating flux. A number of tests were made with machines type PN-68 and PN-100 with various magnetic shunts connected as shown in Fig.8a, to determine curves of commutating flux increase with shock-loading. Oscillograms of the currents in the armature, the interpole and the shunt and the corresponding curves without a shunt are plotted in Fig.8. The use of the magnetic shunt greatly reduces the uncompensated and excess e.m.f's, as will be seen from the test results with different magnetic shunts given in Tables 1 and 2. It is concluded that to reduce the uncompensated reacted e.m.f. by a factor of about 2.5, the ohmic resistance ✓

Card 3/4

SOV/144-59-11-4/21

Methods of Improving the Commutation of d.c. Machines Subjected to Shock-Loading

of the diverter should be such that under steady-state conditions about 25% of the armature current passes through the diverter. There are 8 figures, 2 tables and 6 Soviet references.

ASSOCIATION: Khar'kovskiy politechnicheskiy institut
(Khar'kov Polytechnical Institute)

Card 4/4

YAKOVENKO, V.A., kand.tekhn.nauk, dotsent

Calculation of commutating flux rise for suddenly applied loads. Elektrichestvo no.5:36-39 My '60. (MIRA 13:9)

1. Khar'kovskiy politekhnicheskiy institut.
(Electric machinery)

YAKOVENKO, V.A.

Problem of calculating the rise of commutational current during transient processes. Trudy KhPI 30 no.1:179-188 '60. (MIRA 14:9)

(Commutation (Electricity))

YAKOVENKO, V.A.; TOLKUNOV, V.P.

Experience in adjusting the commutation of P-series d.c. machinery.
Trudy KhPI 30 no.1:203-210 '60. (MIRA 14:9)
(Electric machinery--Direct current)
(Commutation (Electricity))

SHTEPINA, Ya., kand.tekhn.nauk; BENDL, I., kand.tekhn.nauk;
YAKOVENKO, V.A., kand.tekhn.nauk, dotsent

Concerning V.A. IAkovenko's article "Calculation of commutating flux rise for suddenly applied loads." Elektrichestvo no.2:89-92 F '62. (MIRA 15:2)

1. Chekhoslovatskaya Akademiya nauk (for Shtepina, Bendl).
(Electric machinery)
(IAkovenko, V.A.)

YAKOVENKO, V.A., kand.tekhn.nauk

Commutation of electrical machines with impact loads. Vest. elektroprom. 34 no.8:4-9 Ag '63 (MIRA 16:9)
(Electric machinery— Direct current)
(Commutation (Electricity))

YAKOVENKO, V.A., kand.tekhn.nauk

Increase of the current density under the brushes of d.c. machines. Elektrotekhnika 34 no.9:25-27 S '63. (MIRA 16:11)

YAKOVENKO, V.A., kand. tekhn. nauk, dotsent (Khar'kov); KALINICHENKO,
S.P., inzh. (Khar'kov)

Methods for increasing the commutational reliability of the motors of rolling mills. Elektrichestvo no.1:24-27 Ja '64.
(MIRA 17:6)

L 42935-65 EWT(1)/EPA(s)-2
ACCESSION NR: AP5006812 S/0144/65/000/001/0030/0034

16
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B

AUTHOR: Yakovenko, V. A. (Candidate of technical sciences, Docent); Inogorodskiy, A. V. (Engineer)

TITLE: Enhancing the stability of speed characteristics of widely-adjustable-speed d-c motors A

SOURCE: IVUZ. Elektromekhanika, no. 1, 1965, 30-34

TOPIC TAGS: dc motor, speed characteristic, adjustable speed motor

ABSTRACT: The results of an investigation of a P-91, 5.5-kw, 110-v, 250—2000-rpm motor are reported. Three motor circuits were tested: (a) normal supply, (b) separate excitation-winding supply, and (c) with the commutating-pole winding shunted by an adjustable resistor. The "a" and "b" circuits exhibited unstable speed characteristics and too-narrow zones of sparkless operation. The demagnetizing commutation reaction of armature is held

Card 1/2

L 42935-65
ACCESSION NR: AP5006812

responsible as the principal reason for the speed-characteristic instability. A motor with an unstable speed characteristic in the high rpm range could be stabilized by the negative supply of the commutating-pole winding. Hence, stable speed characteristics were attained in circuit "c" by reducing the current in the commutating-pole winding simultaneously with reduction of the excitation current. Multiple (subdivided in height) active conductors are held desirable for widely-adjustable-speed motors. Orig. art. has: 7 figures.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut im. V. I. Lenina (Khar'kov Polytechnic Institute)

SUBMITTED: 11Jun63 ENCL: 00 SUB CODE: EE

NO REF SOV: 004 OTHER: 000

Card 2/2

YAKOVENKO, V.A., kand. tekhn. nauk, dotsent (Khar'kov); MANDRYKA, O.R., inzh. (Khar'kov)

Determination of an equivalent air gap of a d.c. machine. Elektrichestvo no.7:86-90 Jl '65. (MIRA 18:7)

YAKOVENKO, Vasiliy Aleksandrovich, kand. tekhn. nauk, dotsent;
INOGORODSKIY, Arnol'd Vasil'yevich, inzh.

Increasing the stability of the speed characteristics of d.c. motors with a wide range of regulation. Izv. vys. ucheb. zav.; elektromekh. 8 no.1:30-34 '65. (MIRA 18:3)

1. Khar'kovskiy politekhnicheskiy institut.

SYSOYEV, I.N.; YAKOVENKO, V.A.; ZASLAVSKIY, M.Z.

Electromechanical copying system for lathes. Stan. i instr. 36 no.8:4-7 Ag '65. (MIRA 18:9)

L 01294-67 EWT(1)
ACC NR: AP6015031 (A) SOURCE CODE: UR/0144/66/000/004/0420/0429

AUTHOR: Yakovenko, V. A.; Shevelev, A. A.

33
B

ORG: none

TITLE: Investigation of the magnetic flux in the steel of d-c machines at pulsating supply voltage

29

SOURCE: IVUZ. Elektromekhanika, no. 4, 1966, 420-429

TOPIC TAGS: electric machine, d-c machine, magnetic circuit, electric device, steel

ABSTRACT: A theoretical and experimental investigation is reported of B, H, μ, and losses in solid and laminated steel structures whose windings are supplied with a pulsating-voltage energy. The problem was investigated by R. O. Carter et al. (Proc. IEE, v. 95, no. 56, p. 11, 1950); however, the present article adapts the results to pulsating-voltage-fed motors. The B/H curve is analyzed, and formulas for losses are developed. Experimental results obtained with toroidal cores ID = 160 mm, OD = 220 mm, 30-mm thick are presented; five cores were tested: solid, 5-mm laminations, 2-mm laminations, 0.8-mm laminations, and 0.75-mm

Card 1/2 UDC: 621.318.3+621.3.022

L 01294-67

ACC NR: AP6015031

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laminations. Plots of loss vs. ripple factor, loss vs. degree of lamination, and α vs. ripple factor (α is the phase angle between the current and magnetic flux) are shown. Findings: (1) In d-c pulsating-voltage-supplied motors, additional steel loss increases with the ripple factor; however, the solid portions of the magnetic circuit reduce the above effect; (2) The losses caused by the higher harmonics of the pulsating flux must be taken into account; (3) The lag angle of the flux a-c component under sustained conditions, and of the total flux, under transient conditions, largely depends on the degree of lamination; a completely laminated magnetic circuit is recommended for d-c pulsating-voltage-supplied motors. Orig. art. has: 7 figures and 32 formulas.

SUB CODE: 09 / SUBM DATE: 19Jul65 / ORIG REF: 006 / OTH REF: 001

Card 2/2 ZC

YAKOVENKO, V. A.

"Biochemical Changes in the Lipides Isolated From the Germ of Certain Grasses During Their Storage." Cand Tech Sci, Odessa Technological Inst, Odessa, 1953. (RZhKhim, No 17, Sep 54)

SO: Sum 432, 29 Mar 55

YAKOVENKO, V.A.; TORZHINSKAYA, L.R.

Postharvest ripening of corn in various phases of maturity. Izv. vys.ucheb.zav.pishch.tekh. no.4:13-18 '58. (MIRA 11:11)

1. Odesskiy tekhnologicheskiy institut imeni I.V. Stalina, Kafedra biokhimii zerna i zernovedeniya.
(Corn (Maize))

[illegible] : [illegible] M

CATEGORY : Cultivated Plants, Fodder Grasses and Roots.

ABS. JOUR. : RZhBiol., No.4, 1959, No. 15710

AUTHOR : Yakovenko, V.A.; Danil'chuk, P.V.
INST. : AS USSR
TITLE : Effect of Irrigation on the Chemical Composition of Turkestan Millet Grain.

ORIG. PUB. : V sb.: Biokhimiya zerna. 4, M., AN SSSR, [illegible], 128-131

ABSTRACT : According to 1954-1955 findings of the Odessa Technological Institute and the All-Union Selection-Genetics Institute, with cultivation in irrigated conditions, the grain of Turkestan millet contained 2.2 to 3 % less protein than without irrigation, the starch content was increased by 5.6 to 6.7 %, the the cellular tissue content was reduced by 0.32 to 0.34 % with irrigation.

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CARD : 1/1

YAKOVENKO, V.A.; ATANAS, L.G.; TORZHINSKAYA, L.R.

Storage of hybrid corn in the husks under conditions at corn products plants. Izv.vys.ucheb.zav.;pishch.tekh. no.5:3-7 '58. (MIRA 11:12)

1. Odesskiy tekhnologicheskiy institut imeni I.V.Stalina, kafedra biokhimii zerna.
(Corn (Maize)--Storage)

YAKOVENKO, V.A.; ZELINSKIY, G.S.; LEBEDINSKIY, V.G.

Conditions for drying hybrid ear corn. Izv.vys.ucheb.zav.; pishch.
tekh.no.6:25-31 '58. (MIRA 12:5)

1. Odesskiy tekhnologicheskiy institut imeni I.V.Stalina, Kafedra elevatorno-skladskogo khozyaystva i khraneniya zerna.
(Corn (Maize)--Drying)

YAKOVENKO, V.A.; ZELINSKIY, G.S.; LEBEDINSKIY, V.G.

Irregularities in the heating and drying of ear corn at different levels in the pile. Izv.vys.ucheb.zav.; pishch.tekh. no.1:6-12 '59. (MIRA 12:6)

1. Odesskiy tekhnologicheskiy institut imeni I.V.Stalina, kafedra elevatorno-skladskogo khozyaystva i khraneniya zerna.
(Corn(Maize)--Drying)

YAKOVENKO, V.A.; TORZHINSKAYA, L.R.

Effect of the drying of newly harvested ear corn on the grain properties. Izv.vys.ucheb.zav.;pishch.tekh. no.1:13-19 '59.
(MIRA 12:6)

1. Odesskiy tekhnologicheskiy institut imeni I.V.Stalina, kafedra biokhimii zerna i zernovedeniye.
(Corn(Maize)--Drying)

YAKOVENKO, V.A.; KATS, N.A.

Respiration of newly harvested corn in connection with its drying and storage. Izv.vys.ucheb.zav.; pishch.tekh. no.3: 23-28 '59. (MIRA 12:12)

1. Odesskiy tekhnologicheskiy institut imeni I.V.Stalina. Kafedra elevatorno-skladskogo khozyaystva i khraneniya zerna.
(Corn (Maize)--Storage)

YAKOVENKO, V., kand. tekhn. nauk; PIKUS, G., kand. sel'skokhoz. nauk

How drying corn by heated air affect the productivity of seeds.
Nauka i pered. op. v sel'khoz 9 no.10:34-35 O '59 (MIRA 13:3)
(Corn(Maize)--Drying)

ROMENSKIY, N.V.; YAKOVENKO, V.A.; TORZHINSKAYA, L.R.

Fermenting activity of the microflora of corn treated with antiseptics. Izv.vys.ucheb.zav.;pishch.tekh. no.4:3-6 '60. (MIRA 13:11)

1. Odesskiy tekhnologicheskiy institut imeni I.V.Stalina. Kafedra biokhimii zerna i zernovedeniya.
(Corn (Maize)—Bacteriology) (Antiseptics)

BLAZHEVSKIY, Ye.V., dvazhdy Geroy Sotsialisticheskogo Truda; VOVCHENKO, I.V., kand. sel'khoz. nauk, zasl. agronom Ukr.SSR; VOROB'YEV, N.Ye., st. nauchn. sotr.; GESHELE, E.E., doktor biol. nauk, prof.; ZUBRITSKIY, A.A., agronom; KISEL'GOF, Z.S., inzh., zasl. mekhanizator sel'skogo khoz. Ukr.SSR; KLYUCHKO, P.F., kand. sel'khoz. nauk; KORCHAGIN, A.Ye.; LEBEDEV, Ye.M., st. nauchn. sotr.; NASYPAYKO, V.M., kand. sel'khoz.nauk; PIKUS, G.P., kand. sel'khoz.nauk; REKACH, V.N., doktor sel'khoz. nauk, prof.; SPIVAK, I.I., zootekhnik; TEMCHENKO, L.V., kand. sel'khoz. nauk; FEDULAYEV, A.A., agronom; YAKOVENKO, V.A., kand. tekhn.nauk; KITAYEV, I.A., kand. sel'khoz. nauk, red.; MUSIYKO, A.S., akademik, red.; VINNITSKIY, S.P., red.; MOLCHANOVA, T.N., tekhn. red.

[For high corn yields] Za bol'shuiu kukuruzu. [By] E.V. Blazhevskii i dr. Odessa, Odesskoe knizhnoe izd-vo, 1962. 173 p. (MIRA 16:7)

1. Zven'yevoy kolkhoza im. Gor'kogo Kotovskogo rayona na Odesshchine (for Blazhevskiy). 2. Glavnyy agronom sovkhoza "Bessarabskiy" (for Korchagin). 3. Ukrainskaya akademiya sel'skokhozyaystvennykh nauk (for Musiyko).
(Ukraine--Corn (Maize))

YAKOVENKO, V.A.; MALAKHOVTSEV, V.P.

Effect of moisture and circumferential velocities on the damaging of corn kernels. Izv.vys.ucheb.zav.; pishch.tekh. no.5:64-68 '63.
(MIRA 16:12)

1. Odesskiy tekhnologicheskiy institut imeni Lomonosova, kafedra elevatorno-skladskogo khozyaystva.

YAKOVENKO, V.A.

"Methods for the Sanitary Evaluation of Sea Waters" (Metody sanitarnoy otsenki morskikh vod), Leningrad, 1950

YAKOVENKO, V. A.

Sea Currents and the Sanitary Protection of Sea Waters Along the Shores of Coastal Cities, Gig. i San., No 8, pp 11-15, 1954

Translation M-445, 13 May 55

YAKOVENKO, Vladimir Aleksandrovich; KALMYKOV, P.Ye., red.; RULEVA, M.S.,
tekhn. red.

[Methods for the sanitary inspection of sea waters] Metody sanitarnoi otsenki moskikh vod. Izd.2., ispr. i dop. Leningrad, Gos.izd-vo med.lit-ry Medgiz, Leningr. otd-nie, 1959. 179 p. (MIRA 13:1)

(Sea water--Pollution)

YAKOVENKO, V. A., ALFIMOV, N. N., YEREMEYEV, N. N.

"Sanitary protection of sea water near maritime cities."

report submitted at the 13th All-Union Congress of Hygienists, Epidemiologists and Infectionists, 1959.

YAKOVENKO, V.G.; LUCHNIKOV, Yu.S., inzh.

Device for inspecting the sinking of reinforced concrete shells. Transp. stroi. 12 no.5:30 My '62. (MIRA 15:6)

1. Glavnyy inzhener Novorossiyskogo morskogo stroitel'stva (for Yakovenko).

(Novorossisk--Wharves)
(Prestressed concrete construction--Testing)

YAKOVENKO, V.G.

Model construction of the Shirokii pier in Novorossiysk harbor.
Transp. stroi. 12 no.9:29-31 S '62. (MIRA 16:2)

1. Glavnyy inzhener tresta Novorossiyskmorstroy.
(Novorossiysk--Piers)
(Precast concrete construction)

YAKOVENKO, V.G., inzh.

Methods of determining the strength of spun concrete.
Transp. stroi. 13 no.2:48-50 F '63. (MIRA 16:3)
(Precast concrete--Testing)

YAKOVENKO, V.G., inzh.

Machine for grinding bands of forms for manufacturing shells.
Transp. stroi. 13 no.7:64 Jl '63. (MIRA 16:9)
(Lathes)

YAKOVENKO, V.G., inzh.; RASHETSOV, L.S., inzh.

Anchoring of a breakwater. Transp. stroi. 15 no.5:21-23 My '65.
(MIRA 18:7)

BAKLAN, Z.P., mekhnik (Kiyev); YAKOVENKO, V.I., mekhanik (Kiyev)

Increasing the tank capacity of an anticorrosive coating machine.
Stroi. truboprov. 6 no.4:23 Ap '61. (MIRA 14:6)

1. Otdel glavnogo mekhanika stroitel'nogo uchastka - 1
tresta Ukrgazneftestroy.
(Pipe--Equipment and supplies)
(Protective coatings)

7(6), 24(4)

AUTHORS: Veynberg, B. V., Dul'neva, N. M., Meyngard, P. N., Yakovenko, V. L.

SOV/20-121-4-17/54

TITLE: A Polar Spectrohydronephelometer (Polyarnyy spektrogidronefelometr)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 4, pp 634-636 (USSR)

ABSTRACT: This paper gives a short description of a polar spectrohydronephelometer which was designed in 1956 and of some results of the measurements by means of this apparatus. The polar hydronephelometer - an apparatus for transparency measurements - consists of a vessel filled with the water to be investigated. The objectives of the condenser and of a photometric device are immersed in this water. The luminosity of the ground glass of the photometer may be changed by 10^6 times by removal or turning of the measuring lamp and by introduction of a neutral light filter. The condenser sends a narrow cone of light into the water. If the decrease in light intensity is measured in a turbid water, the light of the condenser is directed straight into the objective of the photo-

Card 1/3

meter. The intensity of the scattered light is measured under various angles φ with respect to the beam of the condenser. By some measurements of this kind the indicatrix and the scattering index σ can be measured. The absorption index k may be deduced from the measured values of the index ε of the decrease of the light intensity and of σ. The measurements in the various parts of the spectrum are carried out by means of color filters. In order to determine the degree of the depolarization of light by water, the condenser was furnished with a polarizer and the photometric apparatus with an analyzer. The apparatus discussed in this paper makes it possible to investigate the properties of sea water and river water the extinction coefficient ε of which lies within the interval $0,1 - 6\ m^{-1}$. The indicatrices may be measured for any angle between $0,5^{o}$ and 145^{o} and for 180^{o} (backward scattering). According to many measurements, the properties of the investigated sea water vary considerably near the shore. The indicatrices of the scattering of natural waters are considerably elongated. The intensity of the scattered light has a minimum at scattering angles of $\sim 120^{o}$. For other regions of the sea, the shape of the scattering indicatrix depends only

A Polar Spectrohydronephelometer SOV/2o-121-4-17/54

slightly on the transparency of the water. The light which is scattered by the water is depolarized most at angles of 90 - 120°. The degree of the depolarization of light by water depends in a high degree on the initial orientation of its polarization plane. There are 4 figures and 2 references, 2 of which are Soviet.

PRESENTED: March 3, 1958, by V. V. Shuleykin, Academician

SUBMITTED: March 8, 1958

Card 3/3

SHAMIS, L.I., POPOVA, E.F., KURGANSKAYA, T.K., SHCKOLOVA, T.M. AND
YAKOVENKO, V.M.

Kazakh State University named for S. M. KIROV, Alma-Ata.
Microbiological investigation of Lake "Teresken". Introduction.
SO: MIKROBIOLOGIA, Vol. 20, No. 6, Nov/Dec 51.

27187
S/056/61/041/002/008/028
B102/B205

26.2311 3,2310

AUTHOR: Yakovenko, V. M.

TITLE: Transition radiation in plasma with account of temperature

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 2(8), 1961, 385 - 388

TEXT: V. L. Ginzburg and I. M. Frank (ZhETF, 16, 15, 1954) discovered the radiation occurring when charged particles pass through the interface between media of different refractive indices. The spatial dispersion of such media, however, was not considered in the formulas derived by V. L. Ginzburg, I. M. Frank, and others. Taking account of temperature, however, leads to the occurrence of spatial dispersion in plasma. The author has performed a theoretical study of transition radiation, in which temperature has been taken into account and the plasma ions have been assumed to be at rest. The author considers a particle of charge q, which travels along the z-axis at a velocity $\vec{v}$. At the instant $t = 0$, the particle traverses the interface between a medium having a dielectric constant $\varepsilon(\omega)$ and a plasma which fills the semi-space $z < 0$. When proceeding from the Maxwell equations and the linearized basic hydrodynamic

Card 1/5

27187

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B102/B205

equations, one obtains the expression

$$\frac{dW}{d\Omega}=\frac{q^2v^2}{\pi^2c^3}\sin^2\theta\cos^2\theta\int\limits_0^\infty\frac{\sqrt{\varepsilon_2}\,|A|^2\,d\omega}{|\varepsilon_1\cos\theta+\sqrt{\varepsilon_2(\varepsilon_1-\varepsilon_2\sin^2\theta)}\,|^2},$$

$$A=\frac{(\varepsilon_1-\varepsilon_2)\left(1-\varepsilon_2\beta^2-\beta\sqrt{\varepsilon_1-\varepsilon_2\sin^2\theta}\right)}{(1-\beta^2\varepsilon_2\cos^2\theta)\left(1-\beta\sqrt{\varepsilon_1-\varepsilon_2\sin^2\theta}\right)}+$$

$$+\frac{v_{02}\varepsilon_1(1-\varepsilon_2)}{v\sqrt{\varepsilon_2}\left(1+\sqrt{\varepsilon_2\rho_{02}/\rho_{01}}\right)}\left[\frac{1}{1+(v/v_{02})\sqrt{\varepsilon_2(1-v_{02}^2\sin^2\theta/c^2)}}-\frac{1-\varepsilon_2\beta^2}{1-\varepsilon_2\beta^2\cos^2\theta}\right]. \qquad (5)$$

for the total amount of energy irradiated into the plasma. The defining equations read

$$\varepsilon_2=1-(\omega_0/\omega)^2,\quad \omega_0^2=4\pi e^2\rho_{02}/m^2,\quad k_{1,2}^2=\omega^2\varepsilon_{1,2}/c^2,\quad k_{02}^2=\omega^2\varepsilon_2/v_{02}^2, \qquad (A)$$

$$\varkappa_{1,2}^2=k_{1,2}^2-\lambda^2;\quad \alpha_1^2=(\omega/v_{01})^2-\lambda^2,\quad \alpha_2^2=\omega^2\varepsilon_2/v_{02}^2-\lambda^2,$$

$$f_{1,2}^2=\omega^2/v^2+\lambda^2-k_{1,2}^2,\quad \gamma=(1-\varepsilon_2)/(\varepsilon_2\alpha_1\rho_{02}/\rho_{01}-\alpha_2);$$

$\vec{v}$ is the velocity of motion of the plasma, m is the electron mass, ϱ is the deviation of the electron density from the equilibrium value ϱ_0, and T is the plasma temperature; $r = R\sin\theta$, $z = -R\cos\theta$; $d\Omega = \sin\theta \, d\theta \, d\varphi$. If the particle moves in opposite direction, i.e., out of the plasma, the energy of transition radiation will be given by

$$\frac{dW_{\text{пер}}}{d\Omega} = \frac{q^2 v^2}{\pi^2 c^3} \sin^2\theta \cos^2\theta \int_0^\infty \frac{\sqrt{\varepsilon_2}\,|A|^2 d\omega}{|\varepsilon_1 \cos\theta + \sqrt{\varepsilon_2}\sqrt{\varepsilon_1 - \varepsilon_2 \sin^2\theta}\,|^2},$$

$$A = \frac{(\varepsilon_1 - \varepsilon_2)(1 - \varepsilon_2\beta^2 + \beta\sqrt{\varepsilon_1 - \varepsilon_2\sin^2\theta})}{(1 - \beta^2\varepsilon_2\cos^2\theta)(1 + \beta\sqrt{\varepsilon_1 - \varepsilon_2\sin^2\theta})} + \frac{v_{02}\varepsilon_1(1 - \varepsilon_2)(1 - \beta^2\varepsilon_2)}{v\sqrt{\varepsilon_2}(1 + \sqrt{\varepsilon_2\rho_{02}/\rho_{01}})(1 - \beta^2\varepsilon_2\cos^2\theta)}. \qquad (8)$$

provided the particle velocity is higher than the mean thermal velocity of the plasma electrons. For Cherenkov radiation, the energy flux through an annular area (r, r + dr) throughout the time of flight of the particle is found to be

27387

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Transition radiation in...

$$\frac{dW_{\text{чер}}}{dr} = \frac{q^2}{v^2}\int_0^\infty \frac{(1-\varepsilon_2)^2\,\{(v^2\varepsilon_2/v_{02}^2-1)\,[1-\varepsilon_2(v^2/v_{02}^2-v^2/c^2)]\}^{1/2}\cdot\omega\,d\omega}{\varepsilon_2\,|S|^2}, \qquad (9)$$

$$S = \left[\frac{\varepsilon_2}{\varepsilon_1}\sqrt{1-\frac{v^2}{v_{02}^2}\varepsilon_2+\beta^2\varepsilon_1}+\sqrt{1-\varepsilon_2\left(\frac{v^2}{v_{02}^2}-1\right)}\right]\times$$

$$\times\left[1+\frac{v}{v_{02}}\varepsilon_2\sqrt{\frac{\rho_{02}}{\rho_{01}}\left(1+\varepsilon_2-\frac{v_{02}^2}{v^2}\right)}\right]+\frac{v^2}{v_{02}^2}\varepsilon_2(1-\varepsilon_2).$$

In either case, the effect of temperature will be significant only if v is great compared to the mean thermal velocity of electrons. If $v/v_{02} \ll 1$, then the transition radiation will not depend on temperature. F. G. Bass is thanked for guidance, and E. A. Kaner for advice. There are 4 Soviet references.

ASSOCIATION: Institut radiofiziki i elektroniki Akademii nauk Ukrainskoy

Card 4/5

27187
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Transition radiation in...

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SSR (Institute of Radiophysics and Electronics of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: December 13, 1960

Card 5/5

43128
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B125/B186

26.2351

AUTHORS: Bass, F. G., Kaganov, M. I., and Yakovenko, V. M.

TITLE: Cherenkov radiation and supplementary waves in a dielectric

PERIODICAL: Fizika tverdogo tela, v. 4, no. 11, 1962, 3260-3265

TEXT: The spectral density of the radiation emitted by a particle, moving perpendicularly to the interface dielectric - vacuum (z = 0), is investigated and calculated. Special attention is paid to the generation of supplementary transverse waves of exciton origin. In addition to excitation of exciton waves, their transformation into electromagnetic waves at the interface are considered. The system is described by the Maxwell equations.

$$\mathrm{rot}\,\mathbf{H} = \frac{4\pi}{c} e\mathbf{v}\delta(z - vt)\,\delta(x)\,\delta(y) + \frac{1}{c}\frac{\partial \mathbf{E}}{\partial t} + \frac{4\pi}{c}\frac{\partial \mathbf{P}}{\partial t}, \qquad (1)$$

$$\mathrm{rot}\,\mathbf{E} = -\frac{1}{c}\frac{\partial \mathbf{H}}{\partial t}$$

Card 1/4

for the field excited by a particle moving at the velocity v, the equation

$$\frac{\partial^2 \mathbf{P}}{\partial t^2} + \omega_0^2 \mathbf{P} - \alpha_1 \Delta \mathbf{P} - \alpha_2 \,\mathrm{grad\,div}\, \mathbf{P} = \gamma \mathbf{E} \qquad (2)$$

for the polarization P in the dielectric, the common boundary conditions for the continuity of the tangential components, and a linear condition which is very general for isotropic dielectrics, written in the form $\partial \vec{P}/\partial n + \delta \vec{P} = 0$. The solution can be found in the form $\vec{E} = \int \vec{E}_{\varkappa\omega}(z) e^{i(\varkappa\rho - \omega t)} d\vec{\varkappa} d\omega$. ω_0 is the frequency of exciton absorption; α_1, α_2, and γ are constants describing the structure of the exciton bands. The radiation arising in the vacuum, due to the interaction of the particle with the dielectric, consists of common transition radiation, the Cherenkov radiation, and longitudinal and transverse exciton waves. On leaving the dielectric these two exciton waves become transformed to transverse electromagnetic waves. A continuous Cherenkov radiation spectrum occurs on the boundary of the dielectric plate when particles with sufficiently high speed are leaving this. At decreasing velocities of the particle this spectrum is narrowed, and it disappears completely if the velocity approaches the value c/n_0. At further deceleration a narrow line, associated with the exciton wave, is observed on the entry side. It is shown that the group velocity corresponding to the exciton wave is negative. In isotropic optically active media, (2) is to be replaced by

$$\mathbf{P} + g\varepsilon \frac{c}{\omega} \operatorname{rot} \mathbf{P} = \frac{\varepsilon - 1}{4\pi} \mathbf{E}; \quad g = \frac{f\omega}{c(\omega_0^2 - \omega^2)\varepsilon}. \qquad (15)$$

after Fourier transformation with respect to time. ω is the radiation frequency. At $\epsilon \gg 1$ the dispersion equation has generally three roots. Hence the Cherenkov radiation propagates on the surface of three cones. Fig. 2 shows the frequency dependence of the refractive indices for 2 media, considering all constants of both media as equivalent and assuming that two types of waves propagate in the optically active media: $n_1^2 = \epsilon$, $n_2^2 = 1/\epsilon^2 g^2$. Since spatial dispersion occurs in frequency ranges far from

ω_0 the absorption plays only a minor role and the exciton waves can be observed experimentally. There are 2 figures.

ASSOCIATION: Institut radiofiziki i elektroniki AN USSR (Institute of Radiophysics and Electronics AS UkrSSR). Fiziko-tekhnicheskiy institut AN USSR, Khar'kov (Physicotechnical Institute AS UkrSSR, Khar'kov)

SUBMITTED: May 11, 1962 (initially)
June 28, 1962 (after revision)

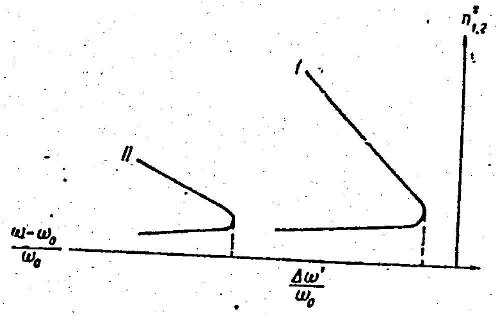

Fig. 2: Frequency dependence of the refractive indices for two media; Legend: I is an isotropic nongyrotropic medium, II is an isotropic optically active medium.

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24.6720
24.6410

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B108/B104

AUTHORS: Kaner, E. A., Yakovenko, V. M.

TITLE: Theory of transition radiation

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 471 - 478

TEXT: The transition radiation of a particle at the boundary between a plasma and a vacuum is studied in kinetic approximation. The problem of an electron moving perpendicularly out from a plasma consists of the Maxwell and linearized kinetic equations and is solved by the Fourier technique. The final result for the spectral density of radiation in the vacuum is

$$\frac{dW}{d\omega d\Omega}=\frac{e^2\beta^2\sin^2\theta\cos^2\theta}{\pi^2c\,(1-\beta^2\cos^2\theta)^2}\,|\eta(\varepsilon,0)|^2. \qquad (5)$$

where $\beta = v_0/c$, θ - angle between direction of motion (z axis) and observer, $d\Omega$ - solid angle element in the θ direction. Formula (5) accounts for

Card 1/5

transition radiation as well as for Cherenkov radiation emitted in the vacuum on the longitudinal waves in the plasma with attenuation. It is shown that in the case of weak spatial dispersion both of the above radiation components contribute to the radiative losses of the electron. In the case of strong dispersion the transition radiation is determined only by the surface impedance of the plasma. For weak dispersion

$$\eta = \frac{1 + \beta\zeta + \beta B (1 - \beta^2 \cos^2\theta)}{\cos\theta + \zeta}, \tag{6}$$

$$\zeta = \frac{(\varepsilon_0 - \sin^2\theta)^{1/2} + \alpha^{1/2}(\varepsilon_0 - \alpha \sin^2\theta)^{1/2}}{\alpha(\varepsilon_0/\alpha - \sin^2\theta)^{1/2}[(\varepsilon_0 - \sin^2\theta)^{1/2} + (\varepsilon_0/\alpha - \sin^2\theta)^{1/2}]}, \tag{7}$$

$$1/B = \alpha[1 - \beta(\varepsilon_0 - \sin^2\theta)^{1/2}][1 - \beta(\varepsilon_0\alpha^{-1} - \sin^2\theta)^{1/2}][(\varepsilon_0 - \sin^2\theta)^{1/2} + \\ + (\varepsilon_0/\alpha - \sin^2\theta)^{1/2}]; \tag{8}$$

$$\varepsilon_0 = 1 - \frac{\omega_0^2}{\omega(\omega - i\nu)}, \quad \alpha = \frac{3T}{mc^2}\frac{\omega_0^2}{\omega^2}, \quad \omega_0^2 = \frac{4\pi e^2 n}{m}.$$

Theory of transition radiation

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B108/B104

and for strong dispersion (impedance approximation)

$$\eta = \frac{1+\beta\zeta}{\cos+\zeta}, \quad \zeta = \left(\frac{Z}{27\pi}\right)^{1/2}\left(\frac{\omega^2\sqrt{mT}}{ne^2c}\right)^{1/3}(1+i\sqrt{3}). \qquad (9)\ (10)$$

$|\zeta| \ll 1$. The radiation losses of a particle moving through a gyrotropic body without spatial dispersion is calculated. In such a case,

$$\eta = [(\cos\theta + P)(1 + Q\cos\theta) - R^2\cos\theta]^{-1}\Big\{(1 + Q\cos\theta)(1+\beta P) - \beta R^2\cos\theta + \frac{1-\beta^2\cos^2\theta}{e_0(\mu_2^2-\mu_1^2)}\left[\frac{(\mu_1^2 - s_1^2)(1+Q\cos\theta) + qR\cos\theta}{1-\beta\mu_1} - \frac{(\mu_2^2-s_1^2)(1+Q\cos\theta)+qR\cos\theta}{1-\beta\mu_2}\right]\Big\}, \qquad (13)$$

where
$$P = \frac{s_0^2(s_1^2+\mu_1\mu_2)}{e_0\mu_1\mu_2(\mu_1+\mu_2)}, \quad Q = \frac{e_1s_0^2 + e_0\mu_1\mu_2}{e_0\mu_1\mu_2(\mu_1+\mu_2)},$$

$$R = \frac{gs_0^2}{e_0\mu_1\mu_2(\mu_1+\mu_2)}, \quad s_0^2 = e_0 - \sin^2\theta, \quad s_1^2 = e_1 - \sin^2\theta; \qquad (14)$$

Card 3/5

Theory of transition radiation

S/056/62/042/002/026/055
B108/B104

μ_1 and μ_2 are the roots of the equations

$$\varepsilon_0\mu^4 - \mu^2(\varepsilon_1 s_0^2 + \varepsilon_0 s_1^2) + s_0^2(\varepsilon_1 s_1^2 - g^2) = 0, \qquad (15)$$

$$\mu_{1,2}^2 = (2\varepsilon_0)^{-1}\{\varepsilon_1 s_0^2 + \varepsilon_0 s_1^2 \pm [(\varepsilon_1 s_0^2 - \varepsilon_0 s_1^2)^2 + 4\varepsilon_0 s_0^2 g^2]^{1/2}\},$$

whose real parts are positive and whose imaginary parts are negative. The radiative losses in an isotropic transparent medium without spatial dispersion are discussed, too. Mention is made of V. L. Ginzburg, I. M. Frank (ZhETF, 16, 15, 1946), G. M. Garibyan (ZhETF, 33, 1403, 1957), V. Ye. Pafomov (ZhETF, 36, 1853, 1959), and B. L. Zhelnov (ZhETF, 40, 170, 1961). There are 12 references: 11 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: Van der Waerden. Appl. Sci. Res., B2, 33, 1951.

Card 4/5

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Theory of transition radiation

ASSOCIATION: Institut radiofiziki i elektroniki Akademii nauk Ukrainskoy SSR (Institute of Radiophysics and Electronics of the Academy of Sciences of the Ukrainskaya SSR)

SUBMITTED: July 2, 1961

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Card 5/5

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ACCESSION NR: AP3002128 GG S/0185/63/008/006/0705/0706

67

AUTHOR: Yakovenko, V. M.

TITLE: Radiation 21 of a charged particle passing through the boundary between a vacuum and an anisotropic ferrodielectric 21

SOURCE: Ukrains'kyy fizychnyy zhurnal, v. 8, no. 6, 1963, 705-706

TOPIC TAGS: transition radiation; charged particle; gyrotropic ferrodielectric; anisotropy; Cerenkov radiation; interface; spectral radiation density; gynotropy

ABSTRACT: The author investigates the transition radiation arising at the boundary between a vacuum and a gyrotropic anisotropic ferrodielectric during the motion of an electron along the axis of gyrotropy. Transition radiation denotes the radiation of a charged particle moving at right angles toward the interface of two media, and it was first examined by V. L. Ginzburg, and I. M. Frank, (Zhurnal eksper. i teor. fiziki, 16, 15, 1946). The author calculates the spectral density of radiation and shows that Cerenkov radiation on extraordinary waves propagates at an obtuse angle to the direction of particle motion. "In conclusion, the author expresses his sincere gratitude to F. G. Bass and P. V. Bliokh for their comments on the results of this study." Orig. art. has: 4 equations.

Card 1/2 ASSN: INSTITUTE OF RADIO PHYSICS AND ELCTRONICS.

L 15181-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2 Pz-6/Po-4/
Pab-10/Pi-4 IJP(c)/AFWL/AEDC(b)/SSD/SSD(b)/ESD(gs)/ESD(t) AT
ACCESSION NR: AP4048260 S/0141/64/007/004/0657/0663

AUTHOR: Yakovenko, V. M.

TITLE: Transition radiation in a magnetoactive plasma 21 B

SOURCE: IVUZ. Radiofizika, v. 7, no. 4, 1964, 657-663

TOPIC TAGS: magnetoactive plasma, transition radiation, kinetic equation, plasma electron oscillation, Cerenkov effect, plasma magnetic field

ABSTRACT: The transition radiation of a charge moving through the boundary of a magnetoactive plasma is solved by the kinetic equation method under the assumption that the electrons are reflected from the plasma boundary specularly, and that the external magnetic field is perpendicular to the boundary between the plasma and the vacuum. The initial equations are the system of Maxwell's equations and the linearized kinetic equation for the plasma electrons, and the radiation

Card 1/2

L 15181-65
ACCESSION NR: AP4048260

3

field is calculated for the vacuum. The solution procedure is essentially that of G. M. Garibyan (ZhETF v. 33, 1403, 1957). Expressions are obtained for the transition radiation without spatial dispersion and with weak spatial dispersion. In the latter case there is an additional plasma wave which produces a Cerenkov radiation that can be observed in vacuum when the particle leaves the plasma, for arbitrary particle velocities. The regions where the transition radiation can be observed, and the particle losses connected with generation of Cerenkov radiation are estimated. "The author thanks E. A. Kaner for suggesting the topic and discussing the results, and F. G. Bass for useful remarks." Orig. art. has: 20 formulas.

ASSOCIATION: Institut radiofiziki i elektroniki AN UkrSSR (Institute of Radiophysics and Electronics, AN UkrSSR)

SUBMITTED: 05Aug63 ENCL: 00

SUB CODE: ME, EM NR REF SOV: 012 OTHER: 000

Card 2/2

ACCESSION NR: [illegible] [illegible] 0226/0228

AUTHOR: Yakovenko, V. M.

TITLE: On the investigation of exciton waves in dielectrics

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 2, 1965, 226-228

TOPIC TAGS: exciton, dielectric, optically active material, charged particle beam

ABSTRACT: The author considers one possibility of amplifying exciton waves by means of their interaction with a beam of charged particles. A dispersion [illegible] with the [illegible] and from this dispersion equation the author obtains, under reasonable assumptions, the growth increment of the exciton-wave amplitude and shows the feasibility of amplification of these waves. The interaction between the beam and exciton [illegible] and a [illegible]

Card 1/2

L 38092-65
ACCESSION NR: AP5005918

"The author thanks F. G. Bass for a discussion of the results." Orig. art. has: 9 formulas.

ASSOCIATION: Instytut radiofizyky ta elektroniky AN URSR, Khar'kov (Institute of Radio Physics and Electronics, AN

SUBMITTED: [illegible] ENCL: [illegible] SUB CODE: EC, EM

NR REF SOV: 002 OTHER: 000

Card 2/2

L 58402-65 EWT(1)

ACCESSION NR: AP5016099

UR/0053/65/086/002/0189/0230
538.3

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B

AUTHOR: Bass, F. G.; Yakovenko, V. M.

TITLE: Theory of emission of a charge passing through an electrically inhomogeneous medium

SOURCE: Uspekhi fizicheskikh nauk, v. 86, no. 2, 1965, 189-230

TOPIC TAGS: transition radiation, 21 inhomogeneous medium, charged particle, phase velocity

ABSTRACT: The present comprehensive review paper deals with radiation emitted by a charged particle passing through a dielectrically inhomogeneous medium. Although transition radiation was discovered by V. L. Ginsburg and I. M. Frank in 1946, according to the authors of the present paper this review is the first systematic exposition of the subject. The major topics covered in the paper are as follows: 1) transition radiation of a charge passing through a boundary between two media, 2) radiation of a charged particle passing through a moving boundary, 3) transition radiation as a result of a charge obliquely incident on a boundary, 4) transition radiation with spatial dispersion of the dielectric constant taken into account, 5) radiation of a point charge passing through a plate, 6) radiation of a particle

Card 1/2

L 58402-65

ACCESSION NR: AP5016099

moving in a medium with periodically varying properties, 7) radiation of a particle in a medium with fluctuating dielectric constant, and 8) radiation of a particle in the presence of obstacles. The review is based on 131 papers, all but 10 of which were published by Soviet scientists. (The actual number of papers listed in the bibliography is 145; however, 14 of these deal with propagation of a charged particle parallel to a plane boundary—a variety of Cerenkov radiation—and with emission of a charged particle in a waveguide and are referred to but not discussed in the review.) Of the 10 Western papers, three American articles deal with electromagnetic radiation from thin films attributed to radiation of plasma oscillations and plasmon reradiation, which according to the present authors is well explained by the transition radiation theory. Orig. art. has: 141 formulas. [CS]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP, EM

NO REF SOV: 133 OTHER: 011 ATD PRESS: 4042

Card 2/2

L 22125-66 EWT(1) IJP(c) GG

ACC NR: AP6004926 SOURCE CODE: UR/0056/66/050/001/0102/0111

AUTHOR: Bass, F. G.; Khankina, S. I.; Yakovenko, V. M.

ORG: Institute of Radiophysics and Electronics, Academy of Sciences, Ukrainian SSR (Institut radiofiziki e elektroniki Akademii nauk Ukrainskoy SSR)

TITLE: The low-frequency properties of a semiconductor plasma situated in a constant electric field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 1, 1966, 102-111

TOPIC TAGS: semiconductor plasma, plasma conductivity, plasma heating, dispersion equation, electron collision, kinetic equation, electron distribution, distribution function, plasma wave, LF propagation, constant magnetic field, electric field, electromagnetic wave

ABSTRACT: In view of the fact that nonlinear effects begin to manifest themselves in semiconductors even in relatively weak fields, and lead to phenomena of practical interest such as negative conductivity, interaction between electromagnetic waves of different frequencies, and others, the authors examine certain properties of low-frequency electromagnetic wave propagation associated with the appearance of electron heating as a result of negative differential conductivity. The in-

Card 1/2

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ACC NR: AP6004926

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clusion of the effects of negative differential conductivity distinguishes this paper from earlier investigations by others. Dispersion relations are obtained for the transverse and longitudinal electromagnetic and electroacoustic waves in a semiconductor situated in constant electric and magnetic fields. The analysis is confined to semiconductors in which interelectron collisions play a substantial role. It is shown by analysis of the kinetic equation for the electron distribution function that in a certain region of the frequency range, the reversal of sign of the conductivity can result in amplification or generation of waves. The expressions are derived for the growth increments of these waves. Orig. art. has: 30 formulas.

SUB CODE: 20/ SUBM DATE: 31May65/ ORIG REF: 007/ OTH REF: 003

Card 2/2 BK

L 25496-66 EWT(l) IJP(c)

ACC NR: AP6009689 SOURCE CODE: UR/0181/66/008/003/0939/0942

57
55
B

AUTHOR: Yakovenko, V. M.

ORG: Institute of Radiophysics and Electronics, AN UkrSSR, Khar'kov (Institut radiofiziki i elektroniki AN UkrSSR)

3/

TITLE: Electric stability of a system with negative differential conductivity

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 939-942

TOPIC TAGS: electric conductivity, semiconductor conductivity, semiconductor carrier, electron interaction

ABSTRACT: The article deals with deviations from Ohm's law, observed in semiconductors even at relatively low voltages as a result of fluctuations in the drift of the hot electrons. Particular attention is paid to the influence of the carrier drift on the character of the instability of the system, which can set in when the electrons interact with an alternating electric field and give rise to negative differential conductivity. It is shown by analysis of the energy balance that longitudinal waves can be generated in the system under certain conditions, and the growth increment of the amplitude of these waves is determined. A criterion is established for the stability of a system consisting of a semiconductor connected in series with a load resistance. A more accurate account of the effects involved calls for the analysis of the kinetic equation, with inclusion of terms accounting for the capture and recombination of the carriers. The author thanks F. G. Bass for interest in the work

Card 1/2

L 25496-66

ACC NR: AP6009689

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and the discussion of the results, and V. L. Bonch-Bruyevich and Sh. M. Kogan for a preprint of their paper. Orig. art. has: 15 formulas.

SUB CODE: 09, 20/ SUBM DATE: 15Mar65/ ORIG REF: 007/ OTH REF: 002

Card 2/2 CC

L 27659-66 EPF(n)-2/EWT(1)/ETC(f)/EWG(m) IJP(c) AT

SOURCE CODE: UR/0141/66/009/001/0207/0209

ACC NR: AP6007642

65
B

AUTHOR: Khankina, S. I.; Yakovenko, V. M.

ORG: Institute of Radiophysics and Electronics, AN UkrSSR (Institut radiofiziki i elektroniki AN UkrSSR)

TITLE: Exciting l-f waves in a semiconductor plasma placed in constant electric and magnetic fields

SOURCE: IVUZ. Radiofizika, v. 9, no. 1, 1966, 207-209

TOPIC TAGS: plasma, plasma physics, plasma electromagnetic wave, semiconductor plasma

ABSTRACT: It was pointed out in a previous authors' work (ZhETF, in printing) that longitudinal waves $k \parallel E_0$ (where k is the wave vector) can be amplified or generated in a semiconductor plasma placed in a constant electric field E_0 and possessing a negative differential conductance. In this article, a constant magnetic field H_0 perpendicular to E_0 is added which makes normal waves different from purely longitudinal and transverse. Formulas for the spectrum and attenuation of these normal waves are developed. The negative differential conductance can be realized in InSb-type semiconductors where the energy transfer occurs with a dispersion by optical phonons ($r = -1/2$) and impulse transfer, by charged impurities ($q = 3/2$). Orig. art. has: 13 formulas.

SUB CODE: 20, 09 / SUBM DATE: 16Aug65 / ORIG REF: 004 UDC: 533.951

Card 1/1

L 41748-66 EWT(1)

ACC NR: AP6018042 SOURCE CODE: UR/0185/66/011/006/0679/0680

70
B

AUTHOR: Yakovenko, V. M.

ORG: Institute of Radiophysics and Electronics, AN UkrSSR, Khar'kov (Instytut radiofizyky ta elektroniky AN URSR)

TITLE: Electric instability produced when a beam of charged particles passes through the interface between two media with different dielectric constants

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 11, no. 6, 1966, 679-680

TOPIC TAGS: transition radiation, charged particle, particle beam, dispersion equation, plasma beam interaction, plasma wave

ABSTRACT: The author discusses the possible occurrence of instability due to the transition radiation produced when a beam of particles passes through a boundary between two media. The dispersion equations for such a beam are obtained from the linearized Maxwell equations for the deviations of the charged-particle density and charged-particle velocity from their mean values, using a space-time Fourier transformation. The case of a low beam density, which is equivalent to that of a cold plasma is considered and expressions are derived for the group velocities of the plasma waves excited by the beam and for the conditions under which plasma waves can be produced. The author thanks F. G. Bass, E. A. Kaner, and V. M. Kontorovich for interest in the work and a discussion of the results. Orig. art. has: 7 formulas.

SUB CODE: 20/ SUBM DATE: 07Feb66/ ORIG REF: 002

Card 1/1

L 06262-67 EWT(1) IJP(c) AT

ACC NR: AP6030979 SOURCE CODE: UR/0181/66/008/009/2793/2795

50
B

AUTHOR: Bass, F. G.; Yakovenko, V. M.

ORG: Institute of Radiophysics and Electronics, AN UkrSSR, Kharkov (Institut radiofiziki i elektroniki AN UkrSSR)

TITLE: Resonance amplification of associated electromagnetic and sound waves by electron drift in semiconductors and semimetals

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2793-2795

TOPIC TAGS: electromagnetic wave, sound wave, electron

ABSTRACT: In the presence of electron drift v arising in semiconductors and semimetals in a constant electric field, a resonance amplification of associated waves (which are produced by the interaction of weakly damped electromagnetic oscillations) is possible. The physics of this phenomenon is described. The following dispersion relation is derived:

$$\left[\omega - kv + \frac{k^2c^2}{\omega_0^2}(i\nu \pm \omega_H)\right](\omega^2 - k^2s^2) = \frac{nm}{\rho}\,\omega \times$$

$$\times \left[\frac{k^2c^2}{\omega_0^2}\omega_H^2 \mp \omega_H kv - i\nu\left(\omega \pm \frac{k^2c^2}{\omega_0^2}\omega_H\right)\right]. \qquad (1)$$

Solution of (1) by successive approximations yields two independent equations

Card 1/3

$$\left.\begin{aligned} \omega - kv + \frac{k^2c^2}{\omega_0^2}(i\nu \pm \omega_H) = 0, \\ \omega = \pm ks. \end{aligned}\right\} (2)$$

The first is a dispersion equation for electromagnetic waves, the second a dispersion equation for sound. In a resonance interaction, the frequencies and wave vectors of both waves coincide; the corresponding branches of the oscillations and resonance points are shown in Fig. 1. As an example, the interaction of the electromagnetic wave (1) $\omega = kv - \omega_H k^2c^2/\omega_0^2$ with the sonic branch $\omega = ks$ is considered. The case where the frequency of the sound wave does not coincide with the frequency of the electromagnetic wave (nonresonance case) is also discussed. Authors thank E. A. Kaner for discussing the results and for his comments. Orig. art. has: 1 figure and 7 formulas.

ACC NR: AP6030979

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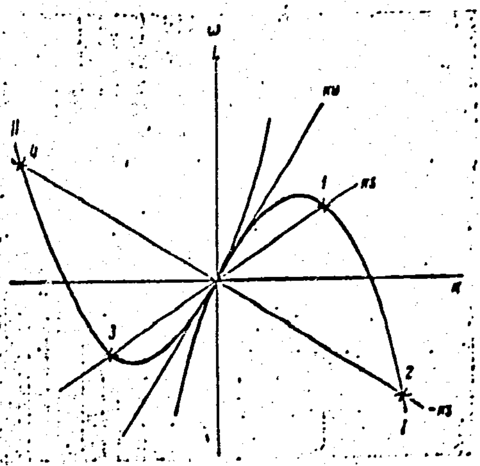

Fig. 1. Dependence of the frequency on the wave vector for sound and electromagnetic waves in the presence of electron drift v > s.

SUB CODE: 20/ SUBM DATE: 02Apr66/ ORIG REF: 002/ OTH REF: 004

Card 3/3